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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,129

08/11/2006

Tomoichiro Tamura

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23850 7590 09/15/2010
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EXAMINER

CARTON, MICHAEL

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

09/15/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,129	Applicant(s) TAMURA ET AL.	
	Examiner MICHAEL CARTON	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 7-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

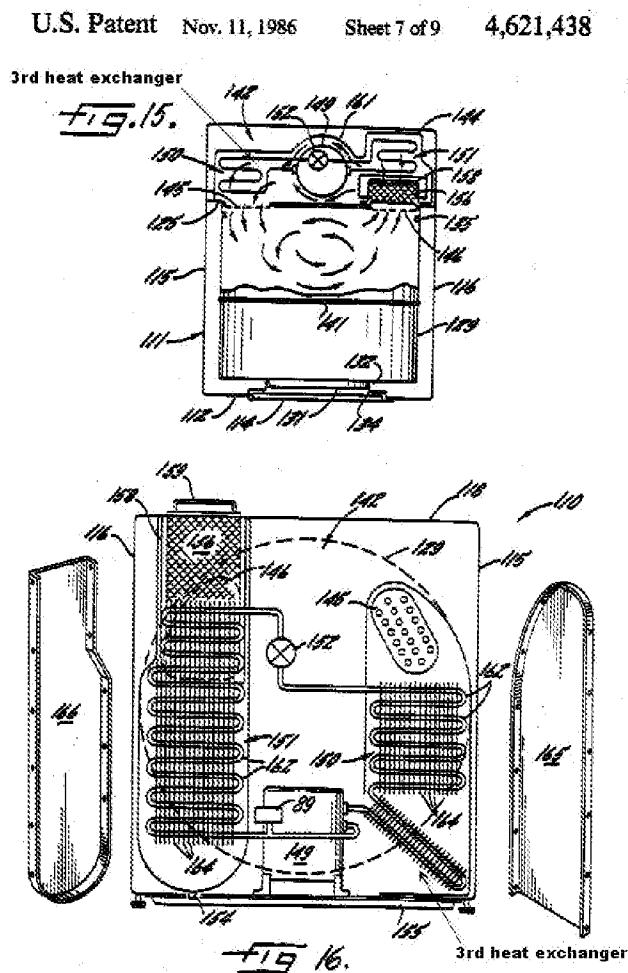
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|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION***Response to Arguments***

1. Applicant's arguments filed 6/28/2010 have been fully considered but they are not persuasive.

With respect to the argument concerning the third heat exchanger illustrated in fig 16 of Lanciaux, the examiner points to annotated fig 16 below wherein the 3rd, unnumbered heat exchanger is pointed out.



Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4,7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lanciaux (US Patent No. 4621438) in view of Sakakibara (US Patent No. 6494051).

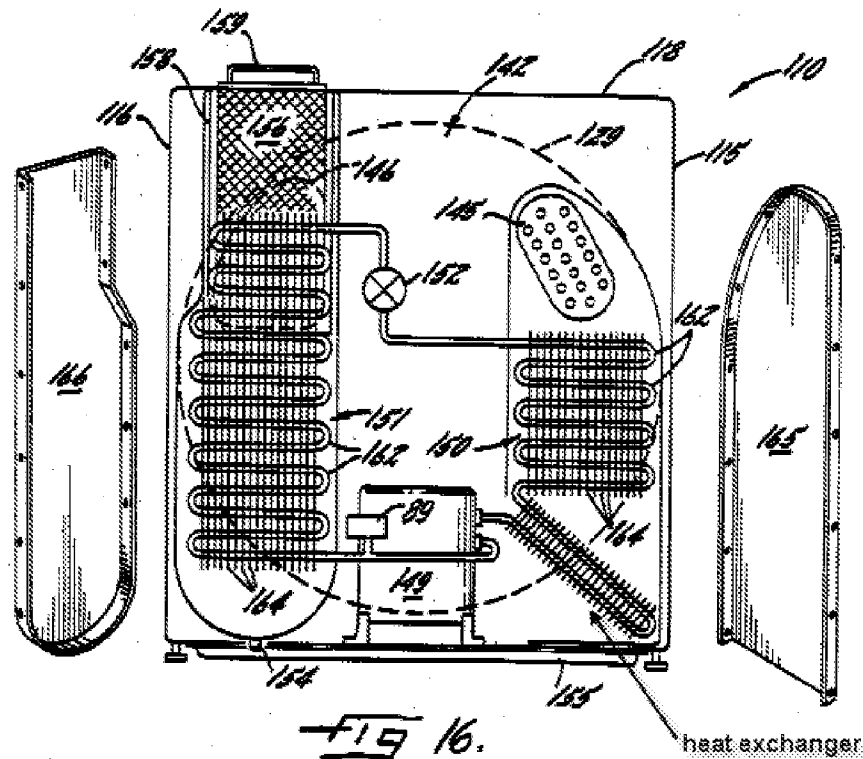
With respect to claim 1, Lanciaux discloses a compressor 149 (fig 15) for compressing a refrigerant; a circulation duct 145 (fig 15) for circulating drying air therein; a radiator 150 (fig 15), disposed inside said circulation duct (fig 16 and fig 15 disclose the radiator inside the duct), for condensing the refrigerant to heat the drying air (fig 17 and fig 18 disclose air with arrows, indicating air passing through condenser, evaporator and heat exchanger which clearly exchanges heat with the said devices); an evaporator 151 (fig 16), disposed inside said circulation duct, for evaporating the refrigerant to absorb heat from the drying air (fig 17 and fig 18 disclose air with arrows, indicating air passing through condenser, evaporator and heat exchanger which clearly exchanges heat with the said devices); a first throttle apparatus 152 (fig 15) for controlling the refrigerant pressure; a heat exchanger (see annotated fig 16 below indicating “heat exchanger”), disposed inside said circulation duct, for functioning as another radiator for condensing the refrigerant to heat the drying air or as another evaporator for evaporating the refrigerant to absorb heat from the drying air (annotated fig 15 above, in the response to arguments, indicates the air flow, and the heat exchanger assisting the other heat

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exchangers), depending on the refrigerant pressure controlled by said first throttle apparatus and (the amount the heat exchanger assists other heat exchangers is obviously dependant on the amount of refrigerant flowing through it); and a drying room 130 (fig 12) connected to said circulation duct thus constituting a circulatory path for the drying air, for offering a space to place a subject to be dried (see abstract, indicating clothes to be dried in space 130).

Lanciaux does not specifically disclose a second throttle apparatus and a heat exchanger connected between said first throttle apparatus and said second throttle apparatus. Sakakibara discloses two throttle apparatuses 230, 282 (fig 21) with a heat exchanger in between 240 (fig 21). As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lanciaux with two throttle apparatuses including a heat exchanger in between as taught by Sakakibara for the purpose of having more control over the temperature and refrigerant flow rate.

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With respect to claim 3, Lanciaux discloses the apparatus according to claim 1, further comprising discharge pressure detecting means for detecting discharge pressure of the compressor (column 6 lines 40-48), and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said discharge pressure detecting means (column 10 lines 13-22).

With respect to claim 4, Lanciaux discloses the drying apparatus according to claim 1, further comprising discharge temperature detecting means for detecting discharge temperature of the compressor, and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said discharge temperature detecting means (column 10 lines 13-22).

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With respect to claim 7, Lanciaux discloses all claimed elements of the drying apparatus according to claim 1, except for using carbon dioxide as the refrigerant. Sakakibara discloses a heat pump system where carbon dioxide is used as the refrigerant (column 7 lines 29-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lanciaux by using carbon dioxide as the refrigerant as taught by Sakakibara for the purpose of having a high heat exchange efficiency thus reducing power consumption.

With respect to claim 8, Lanciaux discloses the heat pump apparatus according to claim 1, wherein said heat exchanger functions as another radiator when the refrigerant pressure controlled by said first throttle apparatus and said second throttle apparatus is equal to or higher than a certain value and as another evaporator when the refrigerant pressure controlled by said first throttle apparatus and said second throttle apparatus is lower than the certain value (the examiner interprets the term radiator and heat exchanger as synonymous, as they both are heat exchangers, and both accomplish the same thing. Furthermore, the limitations are functional and Lanciaux is capable of performing the function.).

With respect to claim 9, Lanciaux discloses the heat pump apparatus according to claim 1, except comprising a refrigerant pipe connecting, in the following order, the compressor; the radiator; the first throttle apparatus; the heat exchanger; the second throttle apparatus; and the evaporator, in a series circuit of the refrigerant.

As disclosed in claim 1, Lanciaux discloses all elements except for the second throttle apparatus. Modified by Sakakibara, Lanciaux discloses all the elements claimed. As the exact sequence is not disclosed by one reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange the parts in the claimed order, for

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the purpose of having the invention function as a dryer, as Lanciaux does, with the benefits of a second throttle, as taught by Sakakibara, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

1. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lanciaux (US Patent No. 4621438) in view of Sakakibara (US Patent No. 6494051) in further view of Honda (US Publication No. 2001/0018831).

With respect to claim 5, Lanciaux, as modified, discloses all claimed elements of the drying apparatus according to claim 1, except for an air temperature detecting means for detecting inlet air temperature of said evaporator, and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said air temperature detecting means. Honda discloses a heat pump controller system wherein an air temperature detecting means 28, 29, 32 (fig 2) for detecting inlet air temperature of said evaporator (paragraph 43), and throttle apparatus control means for controlling said first throttle apparatus 16 (fig 1) and said second throttle apparatus 17 (fig 1) using a detection value from said air temperature detecting means (paragraph 95 discloses capillary tubes 16 and 17 as throttles which respond to decompressing means paragraph 96 states the compressor is controlled by thermal load on vehicle interior which would correspond to temperature detecting means 28, 29, 32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lanciaux, with an air temperature detecting means for detecting inlet air temperature of said evaporator, and throttle apparatus control means for controlling said first throttle apparatus and said second throttle apparatus using a detection value from said air

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temperature detecting means as taught by Honda for the purpose of preventing the compressor from overworking, preventing failure.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Itoh (US Publication No. 20020046570) discloses refrigerant flow in cooling/heating apparatus comprising a compressor 110 (fig 9), a radiator 130 (fig 9), a first throttle apparatus 162a (fig 9), a heat exchanger 150 (fig 9), a second throttle apparatus 161 (fig 9), and an evaporator 120 (fig 9) in this order (see paragraph 58).

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL CARTON whose telephone number is (571)270-7837. The examiner can normally be reached on Monday-Friday 7:30am - 5pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. C./
Examiner, Art Unit 3748

/Thomas E. Denion/
Supervisory Patent Examiner, Art Unit 3748